

FDS6814

Dual N-Channel 2.5V Specified PowerTrench™ MOSFET

General Description

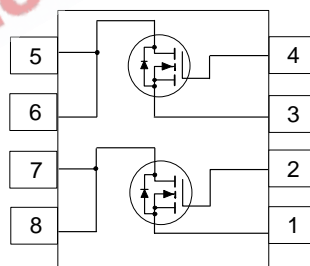
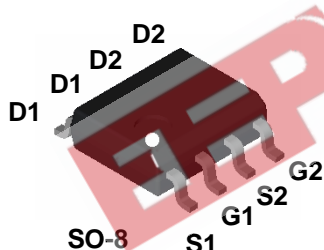
These N-Channel 2.5V specified MOSFETs are produced using a rugged gate version of Fairchild's advanced PowerTrench™ process. It has been optimized for power management applications which require a wide range of gate drive voltage.

Applications

- Low voltage DC/DC Converters
- Load switch
- Battery protection
- Power management

Features

- 8 A, 20 V. $R_{DS(ON)} = 0.020 \Omega @ V_{GS} = 4.5 \text{ V}$
 $R_{DS(ON)} = 0.030 \Omega @ V_{GS} = 2.5 \text{ V}$
- Rugged gate rating ($\pm 12\text{V}$).
- Low gate charge.
- Fast switching speed.
- High performance trench technology for extremely low $R_{DS(ON)}$.
- High power and current handling capability.



Absolute Maximum Ratings

$T_A = 25^\circ\text{C}$ unless otherwise noted

| Symbol | Parameter | Ratings | Units |
|----------------|--|-------------|------------------|
| V_{DSS} | Drain-Source Voltage | 20 | V |
| V_{GSS} | Gate-Source Voltage | ± 12 | V |
| I_D | Drain Current - Continuous (Note 1a) | 8 | A |
| | - Pulsed | 50 | |
| P_D | Power Dissipation for Dual Operation | 2.0 | W |
| | Power Dissipation for Single Operation (Note 1a) | 1.6 | |
| | (Note 1b) | 1.0 | |
| | (Note 1c) | 0.9 | |
| T_J, T_{stg} | Operating and Storage Junction Temperature Range | -55 to +150 | $^\circ\text{C}$ |

Thermal Characteristics

| | | | |
|-----------------|---|----|--------------------|
| $R_{\theta JA}$ | Thermal Resistance, Junction-to-Ambient (Note 1a) | 78 | $^\circ\text{C/W}$ |
| $R_{\theta JC}$ | Thermal Resistance, Junction-to-Case (Note 1) | 40 | $^\circ\text{C/W}$ |

Package Marking and Ordering Information

| Device Marking | Device | Reel Size | Tape width | Quantity |
|----------------|---------|-----------|------------|------------|
| FDS6814 | FDS6814 | 13" | 12mm | 2500 units |

Electrical Characteristics T_A=25°C unless otherwise noted

| Symbol | Parameter | Test Conditions | Min | Typ | Max | Units |
|--------|-----------|-----------------|-----|-----|-----|-------|
|--------|-----------|-----------------|-----|-----|-----|-------|

OFF CHARACTERISTICS

| | | | | | | |
|--------------------|---------------------------------|--|----|--|------|----|
| B _V DSS | Drain-Source Breakdown Voltage | V _{GS} = 0 V, I _D = 250 μA | 20 | | | V |
| I _{DSS} | Zero Gate Voltage Drain Current | V _{DS} = 16 V, V _{GS} = 0 V | | | 1 | μA |
| I _{GSSF} | Gate-Body Leakage, Forward | V _{GS} = 12 V, V _{DS} = 0 V | | | 100 | nA |
| I _{GSSR} | Gate-Body Leakage, Reverse | V _{GS} = -12 V, V _{DS} = 0 V | | | -100 | nA |

ON CHARACTERISTICS (Note 2)

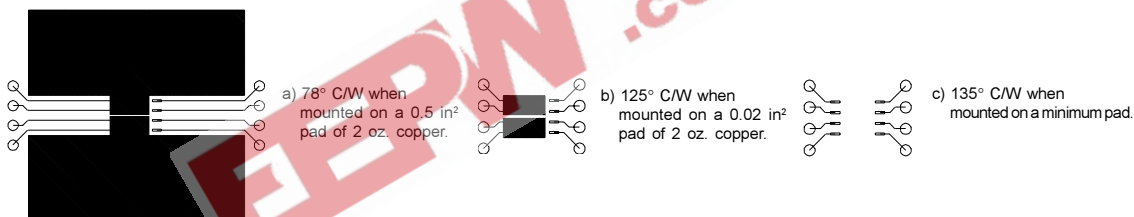
| | | | | | | |
|---------------------|-----------------------------------|--|-----|--|--------------|---|
| V _{GS(TH)} | Gate Threshold Voltage | V _{DS} = V _{GS} , I _D = 250 μA | 0.6 | | 1.5 | V |
| R _{DS(ON)} | Static Drain-Source On-Resistance | V _{GS} = 4.5 V, I _D = 8 A V _{GS} = 2.5 V, I _D = 6.5 A | | | 0.02 0.03 | Ω |
| I _{D(ON)} | On-State Drain Current | V _{GS} = 4.5 V, V _{DS} = 5.0 V | 25 | | | A |

DRAIN-SOURCE DIODE CHARACTERISTICS AND MAXIMUM RATINGS

| | | | | | | |
|-----------------|---|---|--|--|-----|---|
| I _S | Maximum Continuous Drain-Source Diode Forward Current | | | | 1.3 | A |
| V _{SD} | Drain-Source Diode Forward Voltage | V _{GS} = 0 V, I _S = 1.3 A <small>(Note 2)</small> | | | 1.2 | V |

Notes:

- R_{θJA} is the sum of the junction-to-case and case-to-ambient thermal resistance where the case thermal reference is defined as the solder mounting surface of the drain pins. R_{θJC} is guaranteed by design while R_{θCA} is determined by the user's board design. Thermal rating based on independent single device operation.



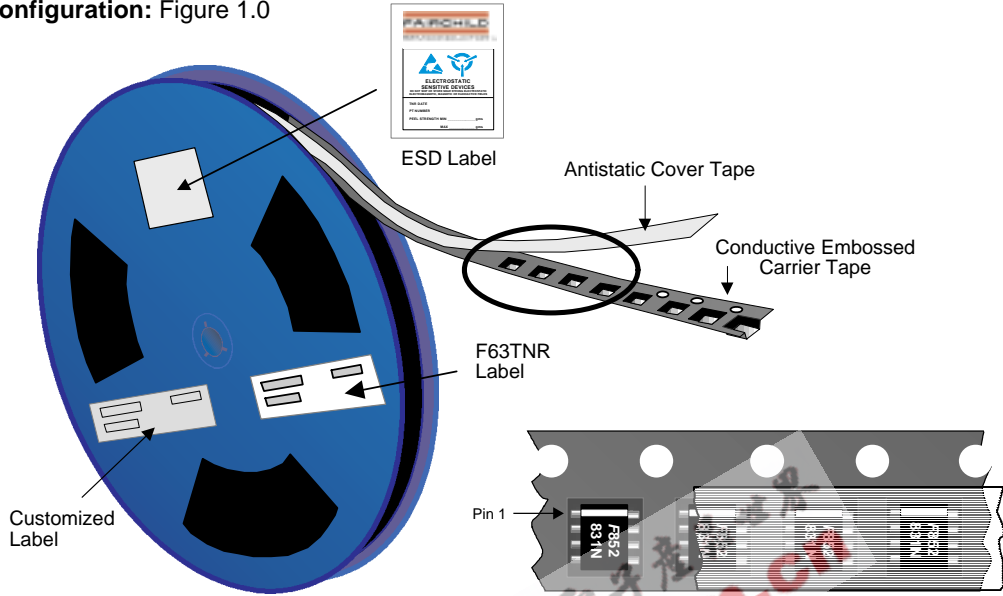
Scale 1 : 1 on letter size paper

- Pulse Test: Pulse Width ≤ 300 μs, Duty Cycle ≤ 2.0%

SO-8 Tape and Reel Data and Package Dimensions



SOIC(8lds) Packaging Configuration: Figure 1.0

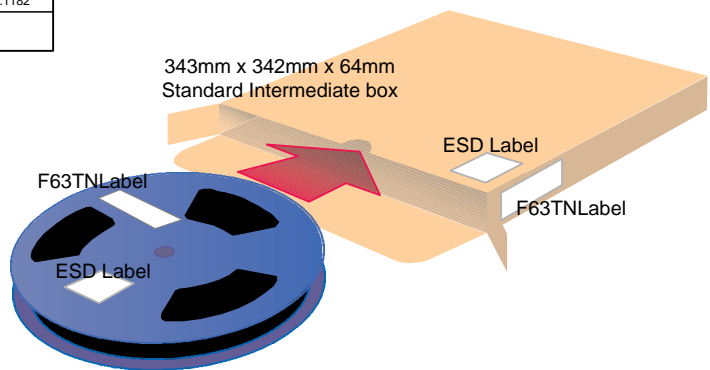


SOIC-8 Unit Orientation

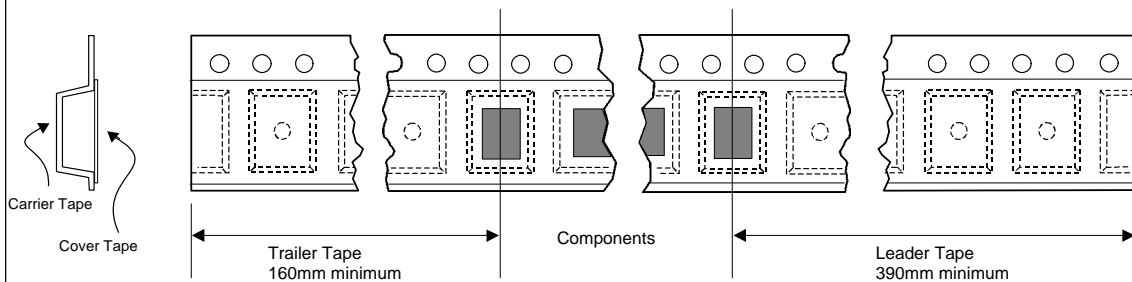
| SOIC (8lds) Packaging Information | | | | |
|-----------------------------------|-------------------------|------------|------------|------------|
| Packaging Option | Standard (no flow code) | L86Z | S62Z | D84Z |
| Packaging type | TNR | Rail/Tube | Bag | TNR |
| Qty per Reel/Tube/Bag | 2,500 | 95 | 200 | 500 |
| Reel Size | 13" Dia | - | - | 7" Dia |
| Box Dimension (mm) | 343x64x343 | 530x130x83 | 76x102x127 | 184x187x47 |
| Max qty per Box | 5,000 | 30,000 | 1,000 | 2,500 |
| Weight per unit (gm) | 0.0774 | 0.0774 | 0.0774 | 0.0774 |
| Weight per Reel (kg) | 0.6060 | - | - | 0.1182 |
| Note/Comments | | | Bulk | |

F63TNR Label sample

| | | | |
|------------------|-------|-----------|-----------|
| LOT: CBVK741B019 | | QTY: 2500 | |
| | | | |
| FSID: FDS9953A | | SPEC: | |
| D/C1: D9842 | QTY1: | SPEC REV: | QARV: |
| D/C2: | QTY2: | CPN: | (F63TNR)2 |

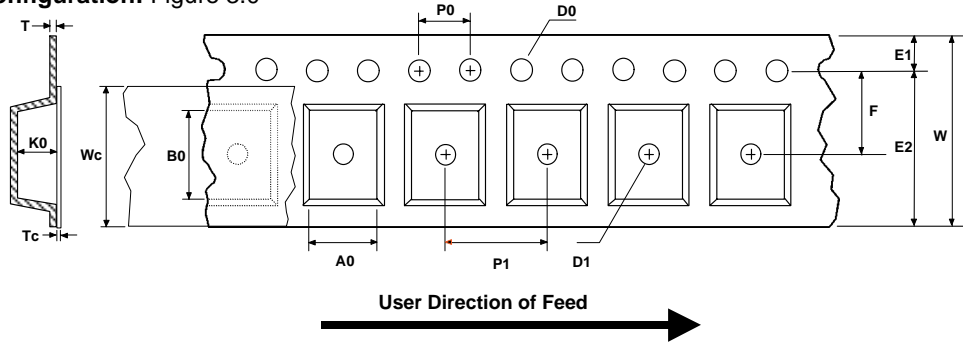


SOIC(8lds) Tape Leader and Trailer Configuration: Figure 2.0



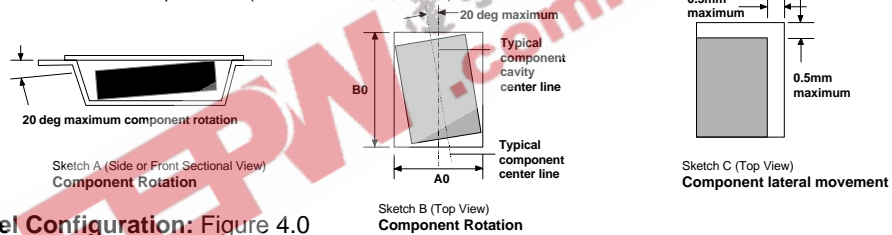
SO-8 Tape and Reel Data and Package Dimensions, continued

SOIC(8lds) Embossed Carrier Tape Configuration: Figure 3.0

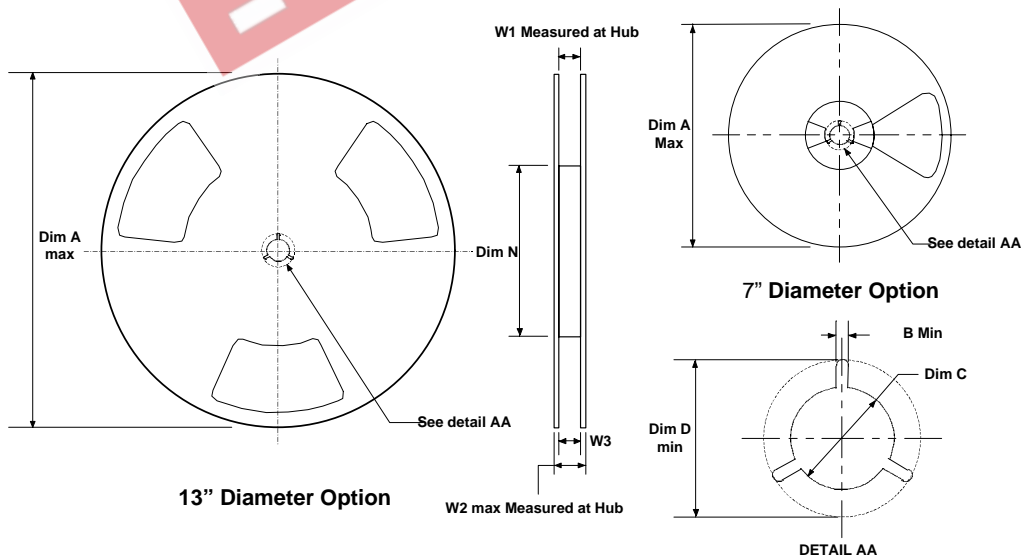


| Dimensions are in millimeter | | | | | | | | | | | | | | |
|------------------------------|---------------|---------------|--------------|---------------|---------------|---------------|--------------|---------------|-------------|-------------|--------------|-----------------------|-------------|---------------|
| Pkg type | A0 | B0 | W | D0 | D1 | E1 | E2 | F | P1 | P0 | K0 | T | Wc | Tc |
| SOIC(8lds) (12mm) | 6.50 ±0.10 | 5.30 ±0.10 | 12.0 ±0.3 | 1.55 ±0.05 | 1.60 ±0.10 | 1.75 ±0.10 | 10.25 min | 5.50 ±0.05 | 8.0 ±0.1 | 4.0 ±0.1 | 2.1 ±0.10 | 0.450 ±/- 0.150 | 9.2 ±0.3 | 0.06 ±0.02 |

Notes: A0, B0, and K0 dimensions are determined with respect to the EIA/Jedec RS-481 rotational and lateral movement requirements (see sketches A, B, and C).



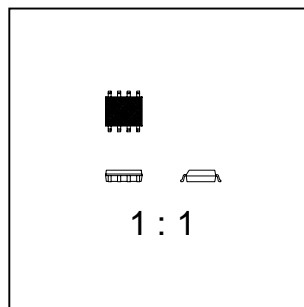
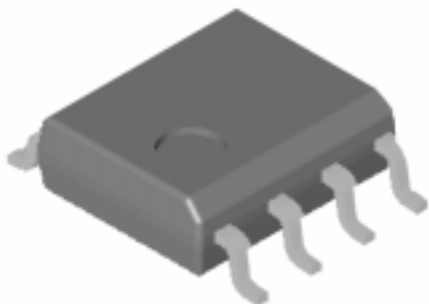
SOIC(8lds) Reel Configuration: Figure 4.0



| Dimensions are in inches and millimeters | | | | | | | | | |
|--|-------------|---------------|--------------|-----------------------------------|---------------|--------------|----------------------------------|---------------|------------------------------|
| Tape Size | Reel Option | Dim A | Dim B | Dim C | Dim D | Dim N | Dim W1 | Dim W2 | Dim W3 (LSL-USL) |
| 12mm | 7" Dia | 7.00 177.8 | 0.059 1.5 | 512 +0.020/-0.008 13 +0.5/-0.2 | 0.795 20.2 | 5.906 150 | 0.488 +0.078/-0.000 12.4 +2/0 | 0.724 18.4 | 0.469 - 0.606 11.9 - 15.4 |
| 12mm | 13" Dia | 13.00 330 | 0.059 1.5 | 512 +0.020/-0.008 13 +0.5/-0.2 | 0.795 20.2 | 7.00 178 | 0.488 +0.078/-0.000 12.4 +2/0 | 0.724 18.4 | 0.469 - 0.606 11.9 - 15.4 |

SO-8 Tape and Reel Data and Package Dimensions, continued

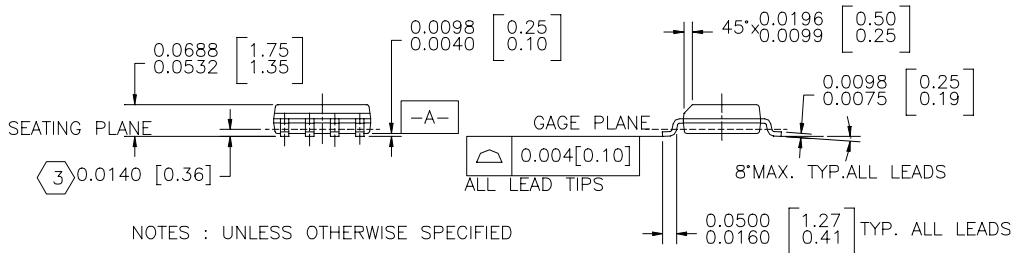
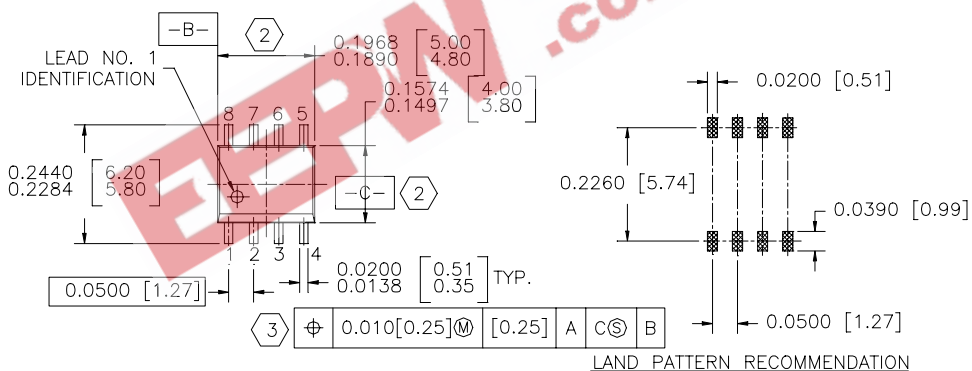
SOIC-8 (FS PKG Code S1)



Scale 1:1 on letter size paper

Dimensions shown below are in:
inches [millimeters]

Part Weight per unit (gram): 0.0774



NOTES : UNLESS OTHERWISE SPECIFIED

1. STANDARD LEAD FINISH:
200 MICRONS / 5.08 MICRONS MINIMUM
LEAD / TIN (SOLDER) ON COPPER.

SO 0.150 WIDE 8 LEADS

2. THESE DIMENSIONS DO NOT INCLUDE MOLD FLASH

3. MAXIMUM LEAD 0.024 [0.609]

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| FACT Quiet Series™ | QS™ | |
| FAST® | Quiet Series™ | |
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